

IN THE CLAIMS

This listing of claims will replace all prior versions and listing of claims in the present application.

1. (original) A method of producing a semiconductor integrated circuit device, comprising the steps of:
 - (a) forming a high dielectric constant insulating film over a semiconductor substrate;
 - (b) forming a conductive film on the high dielectric constant insulating film;
 - (c) forming an insulating film on the conductive film;
 - (d) selectively removing the insulating film thereby forming a pattern;
 - (e) etching the conductive film by using the insulating film having the pattern as a mask thereby forming a conductor piece;
 - (f) removing the insulating film to expose the upper surface of the conductor piece in a state of leaving the high dielectric constant insulating film on both ends of the conductor piece over the semiconductor substrate; and
 - (g) after the step (f), depositing a metal film on the conductor piece and forming a reaction layer at a portion of contact between the conductor piece and the metal film.
2. (original) A method of producing a semiconductor integrated circuit device according to claim 1,

wherein the conductive film is a silicon film and the insulating film is a silicon oxide film.

3. (original) A method of producing a semiconductor integrated circuit device according to claim 1,

wherein the conductive film is a silicon film and the reaction layer is a silicide film.

4. (original) A method of producing a semiconductor integrated circuit device according to claim 1,

wherein the high dielectric constant insulating film is a film having a specific dielectric constant of 2.0 or more.

5. (original) A method of producing a semiconductor integrated circuit device according to claim 1, further comprising the step of:

(h) before the step (a), forming a trench in the semiconductor region by etching the semiconductor substrate and forming another insulating film in the trench,

wherein the high dielectric constant insulating film has a higher specific dielectric constant than that of another insulating film.

6. (original) A method of producing a semiconductor integrated circuit device according to claim 1,

wherein the high dielectric constant insulating film comprises an alumina film, a titanium oxide film, a zirconium oxide film, a hafnium oxide film, a tantalum oxide film, or a ruthenium oxide film.

7. (original) A method of producing a semiconductor integrated circuit device according to claim 1, further comprising the step of:

(h) between the step (f) and the step (g), removing the high dielectric constant insulating film by using the conductor piece as a mask, which is a step of conducting etching under the condition where the etching selectivity of the high dielectric constant insulating film relative to the conductor piece becomes large.

8. (original) A method of producing a semiconductor integrated circuit device according to claim 1, further comprising the steps of:

(h) between the step (f) and the step (g), removing the high dielectric constant insulating film by using the conductor piece as a mask, which is a step of conducting etching under the condition where the etching selectivity of the high dielectric constant insulating film relative to the conductor piece becomes large; and

(i) after the step (h), forming semiconductor regions on both sides of the conductor piece by implanting an impurity to the semiconductor substrate.

9. (original) A method of producing a semiconductor integrated circuit device according to claim 1, further comprising the steps of:

(h) between the step (f) and the step (g), forming another insulating film over the semiconductor substrate including a portion on the conductor piece and then anisotropically etching another insulating film thereby forming sidewall films on the sidewalls of the conductor piece; and

(i) after the step (h), removing the high dielectric insulating film by using the conductor piece and the sidewall films as masks, which is a step of conducting etching under the conditions where the etching selectivity of the high dielectric constant insulating film relative to the conductor piece and the sidewall film becomes large.

10. (original) A method of producing a semiconductor integrated circuit device, comprising the steps of:

(a) forming a first insulating film on a first region of a semiconductor substrate having the first region and a second region;

(b) forming a second insulating film having a higher dielectric constant than the first insulating film on the first insulating film and the second region;

(c) forming a conductive film on the second insulating film;

(d) forming a third insulating film on the conductive film;

(e) selectively removing the third insulating film thereby forming a pattern to each of the first and second regions;

(f) etching the conductive film by using the third insulating film having the pattern as a mask thereby forming a conductor piece to each of the first and second regions;

(g) removing the third insulating film in a state of leaving the second insulating film over the semiconductor substrate on both ends of the conductor piece thereby exposing the upper surface of the conductor piece; and

(h) after the step (g), depositing a metal film on the conductor piece and forming a reaction layer at a portion of contact between the conductor piece and the metal film.

11. (original) A method of producing a semiconductor integrated circuit device according to claim 10,

wherein the conductive film is a silicon film and the third insulating film is a silicon oxide film.

12. (original) A method of producing a semiconductor integrated circuit device according to claim 10,

wherein the conductive film is a silicon film and the reaction layer is a silicide film.

13. (original) A method of producing a semiconductor integrated circuit device according to claim 10,

wherein the first insulating film is a silicon oxide film and the second insulating film is a film having a specific dielectric constant of 2.0 or more.

14. (original) A method of producing a semiconductor integrated circuit device according to claim 10,

wherein the second insulating film comprises an alumina film, a titanium oxide film, a zirconium oxide film, a hafnium oxide film, a tantalum oxide film, or a ruthenium oxide film.

15. (original) A method of producing a semiconductor integrated circuit device according to claim 10, further comprising the step of:

(i) between the step (g) and the step (h), removing the high dielectric constant insulating film by using the conductor piece as a mask, which is a step of conducting etching under the condition where the etching selectivity of the high dielectric constant insulating film relative to the conductor piece becomes large.

16. (original) A method of producing a semiconductor integrated circuit device according to claim 10, further comprising the steps of:

(i) between the step (g) and the step (h), removing the high dielectric constant insulating film by using the conductor piece as a mask, which is a step of conducting etching under the condition where the etching selectivity of the high dielectric constant insulating film relative to the conductor piece becomes large;

(j) after the step (i), forming a first semiconductor regions on both sides of the conductor piece of the first region by implanting an impurity in the semiconductor substrate of the first region; and

(k) after the step (i), implanting an impurity in the semiconductor substrate of the second region thereby forming second semiconductor regions on both sides of the conductor piece of the second region.

17. (original) A method of producing a semiconductor integrated circuit device according to claim 10, further comprising the steps of:

(i) between the step (g) and the step (h), forming another insulating film over the semiconductor substrate including a portion on the conductor piece and then anisotropically etching another insulating film thereby forming sidewall films on the sidewalls of the conductor piece; and

(j) after the step (i), removing the high dielectric constant insulating film by using the conductor piece and the sidewall films as mask, which is a step of conducting etching under the condition where the etching selectivity of the high dielectric constant insulating film relative to the conductor piece and the sidewall film becomes large.

Claims 18-24 (cancelled).

25. (new) A method of producing a semiconductor integrated circuit device according to claim 1,

wherein in the step (f), etching is performed under the condition where the etching selectivity of the insulating film relative to the high dielectric constant insulating film is large, thereby removing the insulating film to expose the upper

surface of the conductor piece in a state of leaving the high dielectric constant insulating film on both ends of the conductor piece over the semiconductor substrate.

26. (new) A method of producing a semiconductor integrated circuit device according to claim 10,

wherein in the step (g), etching is performed under the condition where the etching selectivity of the third insulating film relative to the second insulating film is large, thereby removing the third insulating film to expose the upper surface of the conductor piece in a state of leaving the second insulating film on both ends of the conductor piece over the semiconductor substrate.